

# EM - Edit Mask

With this session parameter, you can specify an edit mask for an input and/or output field that is used in a DEFINE DATA, DISPLAY, INPUT, MOVE EDITED , PRINT or WRITE statement.

<b>Possible settings</b>	See below	
<b>Default setting</b>	None	
<b>Applicable Statements:</b>	FORMAT	Parameter may be specified dynamically with the FORMAT statement.
	DEFINE DATA DISPLAY INPUT PRINT WRITE	Parameter may be specified at statement level and/or at element level.
	MOVE EDITED	Parameter may be specified at element level.
<b>Applicable Command:</b>	None	

The following topics are covered below:

- Syntax
- Blanks in Edit Masks
- Default Edit Masks
- Edit Masks for Numeric Fields
- Edit Masks for Alphanumeric Fields
- Edit Masks for Binary Fields - Format B
- Hexadecimal Edit Masks
- Edit Masks for Date and Time Fields - Formats D and T
- Edit Masks for Logical Fields - Format L

## Syntax

For input fields, values must be entered exactly matching the edit mask. If you would like to display the edit mask for an input field, the field should be defined as modifiable (AD=M).

For a database field, a default edit mask may have been defined in the DDM. If you specify with the EM parameter an edit mask for a database field, this edit mask specified will be used instead of any default edit mask which may be defined for the field in the DDM.

If you specify EM=OFF for a field, no edit mask will be used for the field, not even one that may be defined in the DDM.

At statement level of a DISPLAY, FORMAT, INPUT or WRITE statement, no detail field edit mask may be specified, except EM=OFF.

An edit mask overrides any settings for the session parameters AL, NL and SG.

The characters 9, H, X and Z represent significant print positions in numeric (9,Z), hexadecimal (H), and alphanumeric (X) edit masks. For the difference between 9 and Z, see Edit Masks for Numeric Fields, below.

**Examples:**

```
DISPLAY AA(EM=OFF) AB(EM=XX.XX)
WRITE SALARY (EM=ZZZ,ZZ9)
```

An abbreviated notation can be used for long edit masks. The following examples demonstrate the abbreviated notation which may be used for numeric, hexadecimal, and alphanumeric edit masks:

```
EM=9(4)-9(5) is equivalent to: EM=9999-99999
EM=H(10)      is equivalent to: EM=HHHHHHHHHH
EM=X(6)..X(3) is equivalent to: EM=XXXXXX..XXX
```

## Blanks in Edit Masks

Blanks within an edit mask are represented by the character on your keyboard that in hexadecimal code corresponds to H'20' (ASCII) or H'5F' (EBCDIC), that is, the character "^" (or "¬").

## Default Edit Masks

If no edit mask is specified for a field, a default edit mask is assigned to the field depending on the field format:

Field Format	Default Edit Mask
A	X
B	H
N, P, I	Z9
F	scientific representation
D	depends on default date format (as set with the <b>profile parameter</b> DTFORM)
T	HH:II:SS
L	blank / X

## Edit Masks for Numeric Fields

An edit mask specified for a field of format N, P, I, or F must contain at least one 9 or Z. If more 9s or Zs exist than the number of positions contained in the field value, the number of print positions in the edit mask will be adjusted to the number of digits defined for the field value. If fewer 9s or Zs exist, the high-order digits before the decimal point and/or low-order digits after the decimal point will be truncated.

## Characters for the Definition of Numeric Edit Masks:

Character	Function	
<b>9</b>	Position to be displayed (one digit of the field value).	• The first period inserted is used as a decimal point. Subsequent periods are treated as literal characters.
<b>Z</b>	Zero suppression for leading zeros. This is the default for numeric fields. The letter Z may be repeatedly specified to represent floating zero suppression. Z must not be specified to the right of the decimal point. A zero value may be displayed as blanks using all Zs in the edit mask (see also the session parameter ZP).	

The 9s or Zs can be preceded by one or more other characters.

## Sign Characters

If the first character before the 9s or Zs is +, -, S or N, a sign may be displayed:

Character	Function
<b>+</b>	A floating sign is to be displayed preceding (leading sign character) or following (trailing sign character) the number. The sign may be generated as a plus or minus depending on the value of the field.
<b>-</b>	A floating minus is to be displayed preceding (leading sign character) or following (trailing sign character) the number if the value of the field is negative.
<b>S</b>	A sign is to be displayed to the left of the column. A plus sign is displayed for a positive value and a minus sign is displayed for a negative value.
<b>N</b>	A minus sign is to be displayed to the left of the column if the value of the field is negative.

## Literal Leading Characters

Any number of literal leading characters can appear before the first displayable position (as indicated by Z or 9). These must follow any sign character. If there is no sign character and the first literal leading character is +, -, S or N, it must be enclosed in apostrophes. If a literal leading character is H, X, Z or 9, it must be enclosed in apostrophes.

The first literal leading character specified will appear in the output only if the value contains leading zeros and the edit mask is defined with Z (leading zero suppression). This character will then be used as a filler character displayed instead of a blank for leading zeros. Subsequent literal leading characters will be displayed as they are input.

## Literal Insertion and Trailing Characters

Literal insertion and trailing characters can also be used. The symbol (^) can be used to represent a leading, inserted, or trailing blank. By enclosing significant characters (9, H, Z, X) in apostrophes, it is possible to use any characters as leading, insertion, or trailing characters. Insignificant edit mask characters need not be enclosed in apostrophes. Within the same edit mask notation, it is possible to have groups of leading, insertion, and/or trailing character strings, some of which are bounded by apostrophes and some of which are not.

## Trailing Sign Characters

A trailing sign character can be specified for numeric edit masks by using the + or - character as the last character in the edit mask. A + will produce a trailing + or - sign depending on the value of the field. A - will produce a trailing space or - sign depending on the value of the field. If a leading and trailing sign are specified in the edit mask, both will be produced.

## Examples of Numeric Edit Masks:

The table below lists the results obtained from the original values shown at the top of each column as they are output without editing mask. All values used as column headings represent N format fields. The lines below the top column represent the formats obtained using the different editing masks:

Value	0000.03 (N4.2)	-0054 (N4)	+0087 (N4)	0962 (N4)	1830 (N4)
Edit Mask					
EM=9.9	0.0	4.	7.	2.	0.
EM=99	00	54	87	62	30
EM=S99	+00	-54	+87	+62	+30
EM=+Z9	+0	-54	+87	+62	+30
EM=-9.99	0.03	-4.	7.	2.	0.
EM=N9	0	-4	7	2	0
EM=*9.99	0.03	4.	7.	2.	0.
EM=Z99	00	54	87	962	830
EM=*DMZZ9.9	DM**0.0	DM*54.	DM*87.	DM962.	DM830.
EM=999+	000+	054-	087+	962+	830+
EM=999-	000	054-	087	962	830
IC=\$ EM=ZZZ.99	\$.03	\$54.	\$87.	\$962.	\$830.
EM=H(6)					
- ASCII:	303030303033	30303574	30303837	30393632	31383330
- EBCDIC:	F0F0F0F0F0F3	F0F0F5D4	F0F0F8F7	F0F9F6F2	F1F8F3F0

By combining edit masks with the parameters IC and TC, negative numbers can be displayed in varying formats using a DISPLAY statement.

## Edit Masks for Alphanumeric Fields

An alphanumeric edit mask which is only to be used with A format fields must contain at least one "X" which represents a character to be displayed. An "H" as the first character designates a hexadecimal edit mask. A blank is represented by a (^) symbol. All other characters except parentheses are permissible including leading, trailing, and insertion characters. It is also possible to specify leading, insertion, or trailing characters enclosed within apostrophes. If the character "X", a closing parenthesis, or a quotation mark is specified as an insertion character, it must be enclosed within apostrophes.

If leading characters are used before the first displayable position X, the first of these leading characters will not be displayed. Trailing characters which immediately follow the last permissible print position will be displayed.

The number of positions to be displayed will be adjusted to the length of the edit mask if the mask is shorter than the field.

### Example of Alphanumeric Edit Masks:

The following program lists the alphanumeric edit masks for a field that is defined with format/length A4 and contains the value "BLUE".

```
* EXAMPLE 'EMMASK1'
DEFINE DATA LOCAL
  1 #TEXT (A4) INIT <'BLUE'>
  END-DEFINE
WRITE NOTITLE 'MASK 1:' 5X #TEXT (EM=X.X.X.X)
/             'MASK 2:' 5X #TEXT (EM=X^X^X^X)
/             'MASK 3:' 5X #TEXT (EM=X--X--X)
/             'MASK 4:' 5X #TEXT (EM=X-X-X-X-X-X)
/             'MASK 5:' 5X #TEXT (EM=X' 'X' 'X' 'X)
/             'MASK 6:' 5X #TEXT (EM=XX...XXX)
/             'MASK 7:' 5X #TEXT (EM=1234XXXX)

END
```

```
MASK 1:      B.L.U.E
MASK 2:      B L U E
MASK 3:      B--L--U
MASK 4:      B-L-U-E-
MASK 5:      B L U E
MASK 6:      BL...UE
MASK 7:      234BLUE
```

## Edit Masks for Binary Fields - Format B

Edit masks for binary fields may be set using "X" or "H" notation. For binary fields, the "X" notation is supported as if "H" had been specified instead of "X".

### Hexadecimal Edit Masks

If the character "H" is specified as the first character in an edit mask, the content of an alphanumeric or numeric field will be displayed in hexadecimal format. Each "H" represents two print positions that will occur for each byte in the source field. Characters other than "H" serve as insertion or trailing characters in the mask. The number of positions to be displayed will be adjusted to the length of the edit mask if the mask is shorter than the field. The length of the

edit mask will be adjusted to the length of the field if the field length is shorter than the edit mask.

Insertion or trailing characters may be optionally specified bounded by apostrophes.

All fields displayed with a hexadecimal edit mask are treated as alphanumeric. Therefore, if the edit mask is shorter than the field to be edited, numeric or alphanumeric positions will be displayed from left to right disregarding any decimal point positions.

If a hexadecimal edit mask is used as an input edit mask, every "0-9", "a-f", "A-F", blank and hex zero are accepted as a hex digit.

**Note:**

Blank and hex zero are regarded as "0" and a lower-case letter ("a-f") is regarded as an upper-case letter.

## Edit Mask Examples for Hexadecimal Fields:

The tables below list the hexadecimal edit masks with results obtained from the original fields and values shown above each column. All numeric values ("-10", "+10", "01") to which edit masks have been applied originated in fields defined with N2 format. The alphanumeric value "AB" originated from a field defined with format/length A2.

ASCII:

Value ->	AB	-10	+10	01
EM=HH	4142	3170	3130	3031
EM=H^H	41 42	31 70	31 30	30 31
EM=HH^H	4142	3170	3130	3031
EM=H-H	41-42	31-70	31-30	30-31
EM=H	41	31	31	30

**Note:**

In the case of em=h(n) (hexadecimal output), the value of n must be in the range of  $1 \leq n \leq 126$ . If  $n > 126$ , an error will be displayed only if the corresponding variable has more than 126 elements.

Example:

```
A (A100) := 'A'      /* 100 characters/elements
PRINT A (EM=H(200)) /* no error, as 100<=126, although 200>126
END
```

EBCDIC:

Value ->	AB	-10	+10	01
EM=HH	C1C2	F1D0	F1F0	F0F1
EM=H:H	C1 C2	F1 D0	F1 F0	F0 F1
EM=HH:H	C1C2	F1D0	F1F0	F0F1
EM=H-H	C1-C2	F1-D0	F1-F0	F0-F1
EM=H	C1	F1	F1	F0

## Edit Masks for Date and Time Fields - Formats D and T

In edit masks for fields which are defined with format D (date) or T (time), the following characters can be specified:

### Date - format D, and Time - format T:

Character	Usage
<b>DD</b>	Day.
<b>ZD</b>	Day, with zero suppression.
<b>MM</b>	Month.
<b>ZM</b>	Month, with zero suppression.
<b>YYYY</b>	Year, 4 digits. (see the section Hints for Input Edit Mask)
<b>YY</b>	Year, 2 digits. (see the section Hints for Input Edit Mask)
<b>Y</b>	Year, 1 digit. Must not be used for input fields.
<b>WW</b>	Number of Week. (see the sections Hints for Input Edit Mask and Hints for Week Display in Output Edit Mask)
<b>ZW</b>	Number of Week, with zero suppression. (see the sections Hints for Input Edit Mask and Hints for Week Display in Output Edit Mask)
<b>JJJ</b>	Julian day.
<b>ZZJ</b>	Julian day with zero suppression.
<b>NN...</b> or <b>N(n)</b>	Name of Day (language-dependent). The maximum length is determined by the number of N's or by n. If the name is longer than the maximum length, it will be truncated; if it is shorter, the actual length of the name will be used.
<b>O</b>	Number of week day The <b>profile parameter</b> DTFORM determines whether Monday or Sunday is considered the first day of the week. With DTFORM=U : (Sunday = 1, Monday = 2, etc.). With DTFORM=other : (Monday = 1, Tuesday = 2, etc.).
<b>LL...</b> or <b>L(n)</b>	Name of Month (language-dependent). The maximum length is determined by the number of L's or by n. If the name is longer than the maximum length, it will be truncated; if it is shorter, the actual length of the name will be used.
<b>R</b>	Year in Roman numerals (maximum 13 digits). Must not be used for input fields.

### Syntactical Restrictions for Date Characters

For **Input** and **Output** edit masks, you **may not** use the following:



text			characters		
month	with	month name	MM or ZM	with	LL or L(n)
day name	with	week day number	NN or N(n)	with	O

For **Input** edit masks, you **may not** use the following:

text			characters		
1-digit year	nor	a year in Roman numerals	Y	nor	R
day	without	month or month name	DD or ZD	without	MM or ZM or LL or L(n)
week	without	year	WW or ZW	without	YYYY or YY
month	without	year	MM or ZM	without	YYYY or YY
julian day	without	year	JJJ or ZZJ	without	YYYY or YY
day name	without	week	NN or N(n)	without	WW or ZW
week day number	without	week	O	without	WW or ZW
julian day	with	month	JJJ or ZZJ	with	MM or ZM
julian day	with	week	JJJ or ZZJ	with	WW or ZW
month	with	week	MM or ZM	with	WW or ZW

## Hints for Input Edit Mask

If only year (YY or YYYY) but no month or day is specified within an input edit mask, the values for month and day will both be set to "01". If only year (YY or YYYY) and month (MM) but no day is specified within an input edit mask, the value for day will be set to "01".

If a 2-digits year (YY) is used, the century used to fill up the year representation is the current century by default. However, this does not apply when a Sliding or Fixed Window is set. For more details, please refer to profile parameter YSLW in the Natural Parameter Reference documentation.

If a week number (WW or ZW) but no number of week day (O) or name of day (NN...) is specified, the first day of the week is assumed.

## Hints for Week Display (WW or ZW) in Output Edit Mask

When DTFORM=U (USA format) is set, the week starts on Sunday; whereas for all other DTFORM settings the first weekday is Monday. Whether a week is week 52/53 of the old year or week 01 of the new year depends on which year contains more days of the week. In other words, if Thursday (Wednesday for DTFORM=U) of that week is in the previous year, the week belongs to the previous year; if it is in the next year, the week belongs to the next year.

If the number of week (WW or ZW) and a year representation (YYYY or YY or Y) is in the same edit mask, the display for year always corresponds to the week number, regardless of the year in the underlying date field.

**Example:**

```

DEFINE DATA LOCAL
1 D (D)
END-DEFINE
MOVE EDITED '31-12-2003' TO D(EM=DD-MM-YYYY)
DISPLAY D(EM=DD-MM-YYYY_N(10)) D(EM=DD-MM-YYYY/WW)

```

Although the underlying date is the 31 Dec. 2003, when the week number WW is contained in the edit mask, it displays as:

D	D
-----	-----
31-12-2003_Wednesday	31-12- <b>2004/01</b>

**Time - format T - only:**

Character	Usage
<b>T</b>	Tenths of a second.
<b>SS</b>	Seconds.
<b>ZS</b>	Seconds, with zero suppression.
<b>II</b>	Minutes.
<b>ZI</b>	Minutes, with zero suppression.
<b>HH</b>	Hours.
<b>ZH</b>	Hours, with zero suppression.
<b>AP</b>	AM/PM element.

**Examples of Date and Time Edit Masks:**

<pre> *      EXAMPLE 'EMDATI' EDIT MASKS FOR DATE AND TIME ***** WRITE NOTITLE ' DATE INTERNAL : ' *DATX (DF=L) / '               : ' *DATX (EM=N(9)' 'ZW.'WEEK 'YY) / '               : ' *DATX (EM=ZZJ'.DAY 'YYYY) / '   ROMAN       : ' *DATX (EM=R) / '   AMERICAN    : ' *DATX (EM=MM/DD/YYYY)      12X 'OR ' *DAT4U / '   JULIAN      : ' *DATX (EM=YYYYJJJ)         15X 'OR ' *DAT4J / '   GREGORIAN   : ' *DATX (EM=ZD.' 'L(10)' 'YYYY) 5X 'OR ' *DATG /// * ' TIME INTERNAL : ' *TIMX                      14X 'OR ' *TIME / '               : ' *TIMX (EM=HH.II.SS.T) / '               : ' *TIMX (EM=HH.II.SS' 'AP) / '               : ' *TIMX (EM=HH) END </pre>	
<pre> DATE INTERNAL : 2001-01-02                : Tuesday 1.WEEK 2001                : 2.DAY 2001    ROMAN       : MMI    AMERICAN    : 02/01/2001      OR   01/02/2001    JULIAN      : 200102          OR   200102    GREGORIAN   : 2.January 2001 OR   2 January 2001 </pre>	
<pre> TIME INTERNAL : 10:40:59      OR   10:40:59.5                : 10.40.59.5                : 01.40.59 PM                : 13 </pre>	

## Edit Masks for Logical Fields - Format L

For fields of format L (logical fields), edit masks can be defined as follows:

**(EM = [false-string/] true-string)**

The false-string must not be longer than 31 characters.

### Example of Edit Masks for Logical Field:

```

/* EXAMPLE 'EMLOGV'
/* EXAMPLE OF LOGICAL VARIABLE IN LOGICAL CONDITION
/*****
DEFINE DATALOCAL
1 #SWITCH (L) INIT <TRUE>
1 #INDEX (I1)
END-DEFINE
/*****
FOR #INDEX 1 5
  WRITE NOTITLE #SWITCH (EM=FALSE/TRUE) 5X 'INDEX =' #INDEX
  WRITE NOTITLE #SWITCH (EM=OFF/ON) 7X 'INDEX =' #INDEX
  IF #SWITCH
    MOVE FALSE TO #SWITCH
  ELSE
    MOVE TRUE TO #SWITCH
  END-IF
/*****
SKIP 1
END-FOR
END

```

TRUE	INDEX =	1
ON	INDEX =	1
FALSE	INDEX =	2
OFF	INDEX =	2
TRUE	INDEX =	3
ON	INDEX =	3
FALSE	INDEX =	4
OFF	INDEX =	4
TRUE	INDEX =	5
ON	INDEX =	5